



Standard Guide for Microcrystal Testing in the Forensic Analysis of Methamphetamine and Amphetamine¹

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INTRODUCTION

Microcrystal tests are primarily chemical-precipitation tests in which a light microscope is used to observe and distinguish the different types of crystals formed. These tests require skill and expertise on the part of the analyst that can be gained adequately only through appropriate training and experience in their use. These tests should not be attempted by those who are unfamiliar with them for use in the analysis of methamphetamine or amphetamine.

1. Scope

1.1 This guide describes some standard procedures applicable to the analysis of methamphetamine and amphetamine using microcrystal tests.

1.2 These procedures are applicable to methamphetamine and amphetamine, which are present in solid dosage form or an injectable liquid form. These procedures are not typically applicable to the analysis of methamphetamine and amphetamine in biological samples.

2. Terminology

2.1 *Definitions of Terms Specific to This Standard:*

2.1.1 *aggregation, n*—the collecting of units or parts into a mass or whole.

2.1.2 *birefringence, n*—property of some crystals, having more than one refraction index. This property will result in interference colors, which are viewed through a polarized light microscope.

2.1.3 *blades, n*—broad, flat, elongated crystals.

2.1.4 *grains, n*—thick tablets having nearly equal width, breadth and thickness.

2.1.5 *habit, n*—the external morphology of the crystal.

2.1.6 *microdrop, n*—a small drop of liquid that would fit on the end of a standard size, flattened toothpick. The approximate volume of this drop would be 10 to 25 μL .

2.1.7 *needles (acicular), n*—long, thin crystals with pointed ends.

2.1.8 *plates, n*—blades with nearly equal length and breadth and of a thickness substantially less than the width.

2.1.9 *rods, n*—long, thin crystals with squared off ends.

2.1.10 *tablets, n*—plates with appreciable thickness but less than the length or breadth.

3. Summary of the Technique

3.1 A small sample of the material containing the suspected methamphetamine or amphetamine is dissolved in an appropriate acid and the appropriate precipitating reagent is added. The crystals that are formed are observed and distinguished utilizing a light microscope.

3.2 If the proper formation of crystals is inhibited by the presence of diluents, a purification of the sample based on the volatility of methamphetamine and amphetamine may be performed.

4. Significance and Use

4.1 This technique produces a chemical-precipitation reaction between methamphetamine or amphetamine and the precipitating reagent. The habit and the aggregation of the crystals formed may be used to distinguish methamphetamine and amphetamine from other drugs.

5. Interferences

5.1 *Diluents/Adulterants*—Diluents/adulterants present in combination with methamphetamine or amphetamine in the sample to be tested may inhibit crystal formation or result in crystals that are distorted or otherwise rendered unidentifiable. In these instances, it will be necessary to separate the methamphetamine or amphetamine from the diluents or to use other testing methods to analyze the methamphetamine or amphetamine.

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